
THE LABORATORY JOURNAL

THE OFFICIAL PUBLICATION
OF THE
PATHOLOGICAL AND BACTERIOLOGICAL
LABORATORY ASSISTANTS' ASSOCIATION

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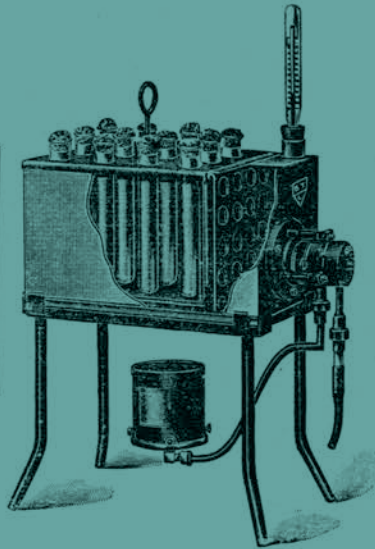
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The Laboratory Journal.

VOL I. No. 1.]

[MARCH, 1913

THE ASSOCIATION.

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Division C.—W. MANBY, Pathological Department, University of Manchester.

Division D.—Vacant.

Hon. Secretary and Treasurer

A. NORMAN, 132 Leopold Road, Kensington, Liverpool.

FIRST ANNUAL MEETING OF THE COMMITTEE HELD IN LONDON ON JANUARY 4TH, 1913.

The Hon. Secretary and Treasurer submitted his report and financial statement for 1912, which was adopted.

It was unanimously decided to invite Professor J. Lorrain Smith to be the first President of the Association. In extending this invitation, the Hon. Secretary was instructed to express the gratitude of the Committee for his help in organising the movement. The Committee feel sure that without his influence and support in obtaining the recognition of the Pathological Society, the Association would not have made such progress.

The Committee felt satisfaction in inviting Mr. Richard Muir, a prominent, and perhaps the best known member of the Association, to be Vice-President for this year.

The following gentlemen were invited to be Honorary Members:—Professor A. E. Boycott, Professor G. Sims Woodhead, Professor I. Walker Hall, Dr. J. C. G. Ledingham, Dr. Milner-Adams, and the Hon. Secretaries and Treasurer of the Pathological Society during their terms of office.

On a motion by Mr. W. A. Mitchell, seconded by Mr. W. Manby, it was decided: "That in future, advertisements of appointments vacant, shall state only district, qualifications, and approximate salary. Applicants to obtain further particulars from the Divisional Representative, or the Hon. Secretary."

It was decided to accept members from other countries, and where possible, invite them to form branches. It is understood that this is being attempted in Canada.

It was resolved that for the present, junior members shall have the same privileges as ordinary members, except that they cannot nominate or vote.

The question of extending membership to assistants in other laboratories was introduced by Mr. McLean. After exhaustive discussion, it was decided that the present time, and the position of the Association, did not justify any immediate action.

THE JOURNAL.

To be called "THE LABORATORY JOURNAL."

It was decided that any member out of employment be allowed to advertise in the Journal free of cost.

Employers in need of a Laboratory Assistant who communicate with the Hon. Secretary shall be allowed to advertise their requirements without charge.

Resolved that business firms be invited to advertise in its pages, and a scale of charges was drawn up.

RULES.

The following alterations are recommended:—

Rule 8.—To read "The representative members of Committee shall also act as divisional secretaries, and shall be elected by ballot of their respective divisions. *Candidates must be proposed and seconded by two ordinary members of their own division.* Two umpires, *not members of Committee*, shall be appointed to count the votes, and shall forward the result to the Honorary Secretary and Treasurer."

Rule 11.—Substitute “three months” for “one year” in line 1.

Rule 13.—Insert “voting” after “members” in line 2.

Rule 14.—Omit “monthly” in line 1.

The suggested alterations to rules will be carried into effect should no objection to them be raised by members within 14 days of publication.

MEMBERSHIP.

The number of members for 1912 was 95, classified as follows:—

	Seniors.	Juniors.	Total.
Division A.	21	3	24
Division B.	19	1	20
Division C.	20	4	24
Division D.	20	5	25
Ceylon & Canada	2	0	2
	82	13	95

During the two months of this year 14 Seniors and 8 Juniors have joined, making our total membership to date 117, which includes one in the Sudan. This completes the list of original members, and in future, candidates will be elected in accordance with the rules of the Association.

FINANCIAL STATEMENT FOR 1912.

RECEIPTS.			EXPENDITURE.		
	£	s. d.		£	s. d.
By Senior Members' Subscriptions	20	10 0	To Printing and Stationery ...	4	13 2
„ Junior Members' Subscriptions	1	12 6	„ Postages	1	19 7
			„ Railway Fares		
			January Meeting	2	8 0
			„ Balance in Bank	13	1 9
	£22	2 6		£22	2 6

DIVISIONAL NEWS.

REPRESENTATION.

Division A.—Messrs. F. R. Chopping, and J. McLean were nominated, and there being no opposition, were duly elected.

Division B.—No new representative was nominated for this district. It was therefore decided to retain the services of the two members of the original committee, both of whom had considerably aided the movement from its inception.

Division C.—Mr. W. Manby was nominated, and there being no opposition, he was again elected to represent this district.

Division D.—A meeting of the members in this division will be held in Edinburgh at an early date, for the election of a representative, and for a general discussion with a view to furthering the interests of the Association. Further particulars will be issued to the members by Mr. Muir (Edin.).

A REPORT OF A GENERAL MEETING IN DIVISION D.

BY THE LONDON REPRESENTATIVES.

A general meeting was held on February 18th and was well attended, 47 London men putting in appearance, thus showing the interest aroused amongst Laboratory Assistants in the Association. A very interesting and instructive evening resulted.

Mr. J. Pollard, who presided, gave a short introductory address and was followed by Messrs. Chopping and McLean, who each read an address on the objects of the Association.

A long and interesting discussion followed, many expressing their views. Those present were practically all in favour of the movement, but some thought that the Association would eventually drift into a "trade union," and would become objectionable to their chiefs. Messrs. Chopping, McLean, and many other members deprecated this view, and pointed out that the policy and aims of the Association depended upon the members themselves. All questions of policy were settled by vote, and if any militant or other objectionable methods were introduced, they would be at once strenuously opposed by the great majority of members; if persisted in, it would probably mean immediate wholesale resignations from the Association, thus rendering it an inert and useless body.

A resolution was passed in favour of admitting assistants in other laboratories as members in addition to those in Pathological and Bacteriological laboratories.*

A hearty vote of thanks was accorded Dr. Carmalt-Jones, who kindly gave permission for the meeting to be held in the library of the Westminster Hospital Medical School.

* This question was discussed by the Committee in January and found to be impracticable at the present time. (See report of committee's meeting).

EDITORIAL NOTES.

In publishing this small Journal it is our aim to make it of practical use to our members in the various branches of Pathological and Bacteriological technique.

The Journal will be published quarterly, and its contents will include: Association news; extracts from articles on technique from British and Foreign papers; original contributions from members; useful hints; advertisements of appointments vacant.

It is proposed in our next issue to start a series of articles on methods for juniors, the object being to take them through the work from the commencement of training.

Our pages are open to members for correspondence and discussion on any matter of interest. In addition, members wishing for information on technique, addresses for obtaining material, animals, etc., are invited to use our pages for the purpose.

We are desirous of making the Journal as interesting and helpful as possible. To achieve this, we earnestly solicit the co-operation of all our members in obtaining material for publication, either original, or extracts from other papers. Do not hesitate to send material because you may consider it too trivial to publish, it may be of value to your fellow members.

We shall be most grateful for any suggestions you may have to offer for the welfare of the Journal and the Association, everything sent to us will receive most careful consideration. Material for the next issue should be in the hands of the Hon. Secretary not later than June 7th.

The President's Prize.—Professor Lorrain Smith has kindly offered a prize to be competed for by members of the Association. The wide field afforded by the conditions gives an opportunity for all to compete on equal terms.

The London Meeting.—From the views expressed by various speakers at this meeting, it is evident that some apprehension is still felt that the Association may ultimately adopt "trade union" tactics. It is expedient that it should be *generally* and *finally* understood that *militancy* occupies no part in the programme of the Association. The support and assistance offered to us by the Pathological Society of Great Britain and Ireland render any tendency to institute methods so incompatible with their views an impossibility.

We hope that this objection to membership will now entirely disappear.

PRIZE OFFERED BY THE PRESIDENT.

The President offers a prize (value 3 guineas) to be competed for by members of the Association.

The competitors are to send to the Hon. Secretary, in the form of an article, an account of any piece of work which they have carried out. The articles will be submitted to judges, and the prize awarded to that which is considered the most valuable contribution to the Journal. Special merit will be attached to originality in the work, and in the method of stating or illustrating the results arrived at.

The subject may be from Histology, Bacteriology, or Museum work, and the articles must be in the hands of the Hon. Secretary by November 1st, 1913.

A METHOD OF STAINING FOR CLUBS IN ACTINOMYCES.

BY E. WHEAL and A. CHOWN (Oxford).

In attempting to obtain some good microphotographs of *Actinomyces* we tried a number of the staining methods usually recommended, but without complete success. After a long series of trials the following method, which gives excellent results, has been worked out for sections.

1. Stain briefly with Ehrlich's hæmatoxylin, so that the cell nuclei become only faintly blue after washing with tap water.
2. Wash well with tap water.
3. Stain with carbol fuchsin as for tubercle bacilli.

4. Wash with tap water.
5. Decolorise with picric acid alcohol (absolute alcohol and half-saturated aqueous picric acid solution in equal parts).
6. Dehydrate, clear and mount.

The clubs are stained a brilliant red colour and stand out very clearly.

Using this method, it appears that by suitable slight modifications in the individual cases, clubs may frequently be found to be as marked, as large and as distinctly stained in the human as in bovine actinomycosis.

THE STAINING OF SPIROCHAETA PALLIDA.

(EXTRACT).

TRIBONDEAU (*Bull. de la Soc. Franc. de Derm. et Syph.*, November, 1912) says there are three desiderata for the successful staining of the organism: (1) The material should be obtained from the infiltrated tissues around the chancre and not from its surface where other micro-organisms abound. (2) All substances which are stainable with silver nitrate, such as, for example, hæmoglobin, should be eliminated as far as possible. (3) The method of fixation and impregnation with silver should be as energetic as possible as the *Treponema* stains with difficulty. Three solutions which can be kept in stock for months are requisite—a fixative, a mordant, and a silver nitrate solution. (a) The fixative consists of:

Formalin, 40 per cent.	2 grams
Pure acetic acid	1 gram
Distilled water	100 grams

(b) The mordant is:

Tannic acid	5 grams
Distilled water	100 „

(c) And the silver solution, made alkaline by Fontana's method—that is:

AgNO ₃	1 gram
Aq. destill.	20 grams

To 15 c.cm. of this solution add ammonia drop by drop until the sepia precipitate produced completely disappears. To the alkaline solution thus obtained the remaining 5 c.cm. of AgNO₃ are gradually added until the solution remains slightly opaque after shaking. This solution (c) keeps active and constant for several months. Technique: (1) The syphilitic material obtained after drying of the chancre with cotton-wool and scarification of the edges till slight bleeding occurs is spread on a slide in the ordinary way and dried in air or the incubator at 37 deg. C. It must not be fixed by heat. (2) Fixation and dehaemoglobinization are achieved by irrigation for one minute with the fixative (a), and the action is perfected by a few drops of absolute alcohol, which are allowed to dry on the inclined slide. (3) The mordant (b) is

allowed to act over a flame till just steaming for thirty seconds. (4) Wash in tap water thirty seconds. (5) Pour off excess of water, and without drying add the ammoniated silver solution, which must be allowed to act over a flame as in (3) for thirty seconds. (6) Wash in distilled water and dry on blotting paper. It will be seen that the time occupied by these manœuvres does not exceed five minutes. The films should have a yellowish tint when finished. They should not be mounted in balsam or left for long under a cedar-wood oil or xylol, or the stain will fade. The *Treponema* is easily seen, especially where it overlies the red blood corpuscles. The *Sp. refringens* and *balanitidis* are distinguished by their darker tint and morphological characters. It is claimed for the method that it is easy, certain, and rapid, that dried specimens can be examined with success even a year later, and that it requires no special skill or expensive apparatus.

B.M.J., January 25th, 1913.

THE CULTIVATION OF ANTHRAX BACILLI FROM WOOL AND HAIR.

By F. W. EURICH, M.D.

(EXTRACT).

The usual proceeding of making a wash is adopted according to the size and condition of the sample (it may be heavily laden with blood, fæces or mud), a quantity of this is put into a flask with 50 to 100 c.c. of boiled water. To this wash are added about 3 to 5 c.c. of a 5 per cent. solution of caustic potash. If the wool be very deeply blood stained, the mixture is allowed to stand for some hours in the incubator (at 37 deg. C.), and is then poured into a Petri dish and the wool or hair is well teased. The addition of the caustic potash slightly facilitates this teasing, but its main object is the formation of an alkali albuminate which will not coagulate when the wool wash is heated to 80 deg. C. This is the next step, and the mixture is kept at that temperature for two minutes. Tubes of melted peptone agar (6-9 c.c.) are then inoculated, each with $\frac{1}{3}$ to $\frac{1}{2}$ c.c., and occasionally even more, of the wash, and poured into Petri dishes. If there be blood in the wash it is best to inoculate the melted agar at 80 deg. C., or very little below; the resulting plate is considerably clearer than if the melted agar be first allowed to cool to 45 deg. or 50 deg. C. If Petri dishes larger than the usual size (4 in. diameter) be used, the quantity of agar should be increased. More importance is attached to the deep-lying colonies than to those on the surface of the agar. These deep-lying colonies, though absolutely characteristic are difficult to describe. To the naked eye, or under a hand lens, they look not unlike the tell-tale filaments found in the urine of patients suffering from a slight gleet, and are rather opaque white, with maybe a kind of nebula at one end. Under x 50 magnification they are of a clear greenish-grey; the main mass of the growth resembles an irregular coil of fine twine into which knot upon knot

has been tied. From this a few delicate tendril-like outgrowths pass into the surrounding agar; they do not radiate from a centre, but may spring from any part of the colony. Should one or more of these "tendri's" reach the surface of the agar, then a delicate surface growth may appear—sometimes in the form of a mere curling filament.

At times some short and delicate hairs, rarely spicules, beset the tendrils, but they are never very numerous, and may be absent. After twenty-four hours the growth becomes rapidly more opaque and granular, details become blurred, and the graceful curves of the tendrils are lost.

Plating-out with inoculation of the agar white fluid, enables the cultivation of anthrax bacilli from putrifying bodies when every other method of cultivation has failed. In these cases it is useful to take blood not only from the various organs, but from a superficial vein—of the leg for preference.

Journal of Pathology and Bacteriology, October, 1912.

TECHNIQUE OF ROSS'S JELLY METHOD.

(EXTRACT).

The jelly method as invented by H. C. Ross is as follows: 3 c.cm. of a 2 per cent. solution of agar in water, boiled and filtered; 1 c.cm. of Unna's polychrome methylene blue (Grubler), which has been previously diluted with two volumes of water—that is 1 in 3; and 2 c.cm. of a solution containing 4.5 per cent. sodium citrate, 1.5 per cent. sodium chloride and 0.225 per cent. atropine sulphate.

This boiled up together in a test tube and 0.3 c.cm. of a 5 per cent. solution of sodium bicarbonate (alkali solution) added.

Then a drop of this mixture when molten is poured on to a microscopic slide and allowed to spread thereon, to cool, and to set.

The chancre to be examined should be pricked with a large needle, and the blood squeezed from it so as to obtain the deeply situated cells. A drop of this blood—which, for convenience of conveyance and for the prevention of clotting, may be citrated with an equal quantity of 3 per cent. solution of sodium citrate and 1 per cent. sodium chloride—is placed upon a cover glass and inverted on to the set jelly.

The blood spreads out between the cover glass and the jelly in a thin film. In five minutes, when the cells have come to rest, the specimen can be examined under the microscope. The presence of the atropine in the jelly is optional, but it causes the cells to exhibit amœboid movements, and this serves to differentiate the living cells from the dead ones, and the stain enables the cell contents to be distinguished clearly. The granules of the leucocytes stain scarlet while the cells themselves are still motile; then as the nuclei stain—at first a pale blue, but later a deep ruby red, the motility ceases, for the cells die.

B.M.J., December 14th, 1912.

A RAPID METHOD OF STAINING *TREPONEMA PALLIDUM*.

A. FONTANA ("LA PRESSE MEDICALE"), SEPTEMBER, 1912.

The scraping to be examined is diluted with a drop of distilled water, spread on a slide and fixed by passing through a flame.

A few drops of a 5 per cent. solution of tannic acid in distilled water are then applied and heated for 30 seconds till slight vapour rises, the specimen being then washed in running water for a further 30 seconds.

A few drops of a solution containing 5 parts of nitrate of silver, and 9 parts of liquid ammonia, in 100 parts of distilled water are then applied and heated in the flame for 20 or 30 seconds according to the intensity of staining desired. The whole process occupies 70 to 80 seconds and is not only rapid, but produces a remarkably intense degree of staining for *treponema pallida* and several other varieties of spirochaetes. In the preparation of the second solution the ammonia should be added drop by drop to the solution of nitrate of silver.

A precipitate is at first formed which is dissolved in excess of alkali, but the solution should not be too alkaline. In order to avoid this, as soon as the precipitate has completely dissolved a few drops of the 5 per cent. solution of nitrate of silver should be added, so as to obtain a slightly opalescent liquid which will keep for several months.

A DILUTING FLUID FOR STANDARDIZATION OF VACCINES WITH THE HEMOCYTOMETER.

(EXTRACT).

Hydrochloric acid 2 c.c.
 Bichloride of mercury, 1 to 500 100 c.c.
 Acid fuchsin, 1 per cent. aqueous solution, q.s. to colour.

Add the fuchsin until the solution is a deep cherry red and filter. A drop of the filtered solution is placed on the ruled stage of the hemocytometer, covered with a coverslip, and examined with a four millimeter objective.

The colour should be just deep enough not to obscure the ruling. If the colour is too deep, filter again, as each filtration removes some of the fuchsin. If not deep enough, add more fuchsin solution.

Using the red dilution pipette, draw up the bacterial emulsion to the .5 or one mark, and the diluting fluid to the one hundred and one mark. Shake vigorously for three minutes, allow two or three drops of fluid to run out of the pipette, then deposit a small drop on the stage of the hemocytometer. Cover with a polished glass coverslip and set aside half an hour for sedimentation to occur. Make the count with a small diaphragm and a strong light. Keep the small square being counted well in the centre of the microscopic field. Before counting, focus up from the ruled lines to ascertain if all the bacteria have settled on the ruled stage. Make the count and the subsequent calculation as for red blood cells.

The bichloride forms a mercury albuminate on the surface of the bacteria and causes more rapid sedimentation; the hydrochloric acid keeps the whole in solution, and the acid fuchsin stains the bacteria, making them more visible.

Journal of Medical Research, November, 1912.

A RAPID METHOD OF MACERATING BONES.

BY F. A. IZZARD, CAMBRIDGE.

The preparation to be macerated, say, for instance, a wrist joint, fresh from the operating theatre, should be prepared as follows:

Take the preparation, and make several superficial incisions about it, taking care that the incisions are only a little deeper than the skin, because, should the specimen be a periosteal sarcoma, or anything of a delicate nature, the knife, cutting too deep, may distort, or even spoil, the whole effect of the beautiful coral appearance which can be obtained by this method. Having prepared the specimen thus far, you should then proceed to put it into a pan containing water (rain water preferred), which should be at 85 deg. Fahrenheit, and kept at that, until the specimen has finished macerating. It is necessary to change the fluid about every four days, or otherwise the fluid becomes stagnant and hinders the process of rapid maceration; besides allowing the fat to solidify inside the bones, which would cause a deal of trouble.

The fluid should be changed every four days until the bones can be seen to be perfectly free from any soft material. The bones can then be taken from the pan and scalded with two or three kettles of boiling water, which will clean off all the excess of filth from the bones, and the biggest portion of the fat will also come from them. You then get another supply of boiling water and scrub the bones with a plentiful supply of soap, using a tooth brush, as the ordinary nail brush is much too coarse. Having done that, you scald the bones again with another kettle of water to clear them of any sediment of soap or maceration material which may still hang about them. You then put the bones to drain and dry in the sun or by a fire. When they are perfectly dry you should then examine them to see if there are any signs of grease left in them. If this method is strictly adhered to, as a rule, they are perfectly free; but should any signs of grease be detected, they should be put into "benzoline" for two or three days, when the grease will soon leave them.

When the bones are taken from the benzoline they should be drained and scrubbed again with hot water and soap and dried as before. They will, as a rule, dry a very good colour, but to get them particularly white they should be put into a 10 per cent. solution of peroxide of hydrogen (distilled water being used) for several days. They will take no harm if they are left in longer. You then take them from the bleaching solution and drain and dry as before. The bleaching solution can be used for several specimens before becoming stagnant and useless. Any use of the knife should be abandoned after you have made your first incision. The main points of this method are: *that you should keep the proper temperature throughout*, as it can clearly be seen that the secret of this method is "*maceration by bacteria.*"

It would be well to mention that before putting bones into benzoline a couple of small holes might be made to allow the benzoline to enter more quickly. Another point worth mentioning is, to put two plates on the bottom of the macerating pan while the maceration is proceeding, as the bones sometimes tend to get stained through lying on the tin. The plates will also aid in regulating the heat. They should be put in the pan upside down.

A METHOD OF CUTTING FROZEN SECTIONS BY EMBEDDING IN GELATIN.

BY J. F. GASKELL, *Beit Memorial Research Fellow,
St. Bartholomew's Hospital.*

(EXTRACT).

The tissues to be embedded are best fixed in some mixture containing formalin. The fixatives most commonly used have been 10 per cent. formalin in isotonic saline solution, or 10 per cent. formalin in Muller's fluid.

The tissue must be well washed for several hours in running water before embedding. If any formalin is left in the tissue, it will formalise the gelatin and prevent penetration of the mass. The gelatin is torn up in pieces and allowed to soak in water for 3-4 minutes, if over soaked the resultant mass is not stiff enough to cut easily.

The soaked gelatin is wrung out by hand and is placed in a small beaker, covered to prevent evaporation, and melted in an ordinary paraffin oven. It is then transferred to an ordinary incubator at 37 deg. C., at which temperature the embedding is accomplished. The tissue, thoroughly washed, is freed from superfluous moisture with blotting paper and then dropped into the fluid gelatine at 37 deg. C., and allowed to soak for at least two hours. Longer periods than four to five hours are unnecessary, and are to be avoided, as no better penetration will take place.

The tissue is then cast in paper boxes in the gelatin in which it has been soaked. The mass, allowed to set at room temperature, is then subjected to a hardening process. The hardening of the block is done by means of a formalin either as vapour or in solution. The vapour method is the more satisfactory, the blocks are placed in a chamber containing strong formalin, and can be left in this chamber indefinitely till wanted. The hardening is not satisfactory in a less period than three days, and improves to some extent with longer treatment. If the block is not sufficiently hardened, the sections obtained are difficult to manipulate and tend to adhere to the lifter and to each other. The embedded tissue may be stored for a considerable time in 5 per cent. formalin, it is as well, however, to transfer blocks to the formalin vapour chamber for a few days before cutting. The blocks should be pored just before cutting, and placed in water for a minute or two. If the block has been long hardened it sometimes does not cut very well, this can be remedied by leaving it in water for ten minutes or so. A drop of gum solution should be used to obtain a good contact between the gelatin block and the stage. All ordinary watery stains can be used, and the sections are mounted in glycerine jelly, Farrant's solution, or levulose syrup.

Journal of Pathology and Bacteriology, July, 1912.

USEFUL HINTS.

In cold and foggy weather, moisture condensing on the front lens of the eyepiece during use, can be prevented by rubbing a little soap on the lens and immediately wiping it off.

The B.P. glycerine of starch forms a splendid luting for anærobic apparatus, and for numerous other purposes. It has none of the objections of soft soap and does not affect rubber in the way that vaseline and other oily substances do. For convenience the formula is appended.

Starch	20 grammes.
Glycerine	130 c.c.
Distilled Water	30 c.c.

Mix thoroughly, and heat together stirring constantly, until a translucent jelly is formed. Store in a jelly can covered with the half of a Petri's plate to avoid admittance of dust.

Dental composition forms an admirable substance for making moulds of hard or fairly firm objects. It is readily softened in hot water and can be used repeatedly.

In cleaning microscopes remember that, as a rule, lacquers are soluble in alcohol, turpentine, xylol, etc.,. It is better to avoid the use of such fluids for cleansing purposes, but when compelled to do so, use them sparingly. Microscopists usually use a silk handkerchief or a piece of "papier josef" slightly damped with xylol for cleaning oil from lenses.

Olive oil and turpentine in equal parts is a good mixture to use for cleaning the metal work, and old microscopes are much improved in appearance by its application.

CORRESPONDENCE.

The following requests for information have been received :

"Can one of our members recommend a good method for isolating delicate micrococci, e.g., pneumococci, streptococci, etc., from morbid secretions in which they are associated with rapidly growing bacilli of the proteus group. Sheep's blood-serum plates and other sera media have been tried with only partial success?"

J. Mc.L.

Another member writes :

"I should feel much indebted to any member who can give me a good method of isolating the various organisms to be found in sputa, T.B. excepted."

J.C.

Replies to these questions may be sent to the Hon. Secretary who will hand them over to the enquirers, and if suitable, will publish them in the next issue of the Journal.

APPOINTMENTS.

- C. P. HYDE, University of Bristol, to Cancer Research Laboratory, University of Manchester.
 G. D. BERTRAM, University College, Newcastle-on-Tyne, to Pathological Laboratory, University of Edinburgh.
 C. E. BERRY, Guy's Hospital, to Bacteriological Laboratory, Seamen's Hospital, Greenwich.

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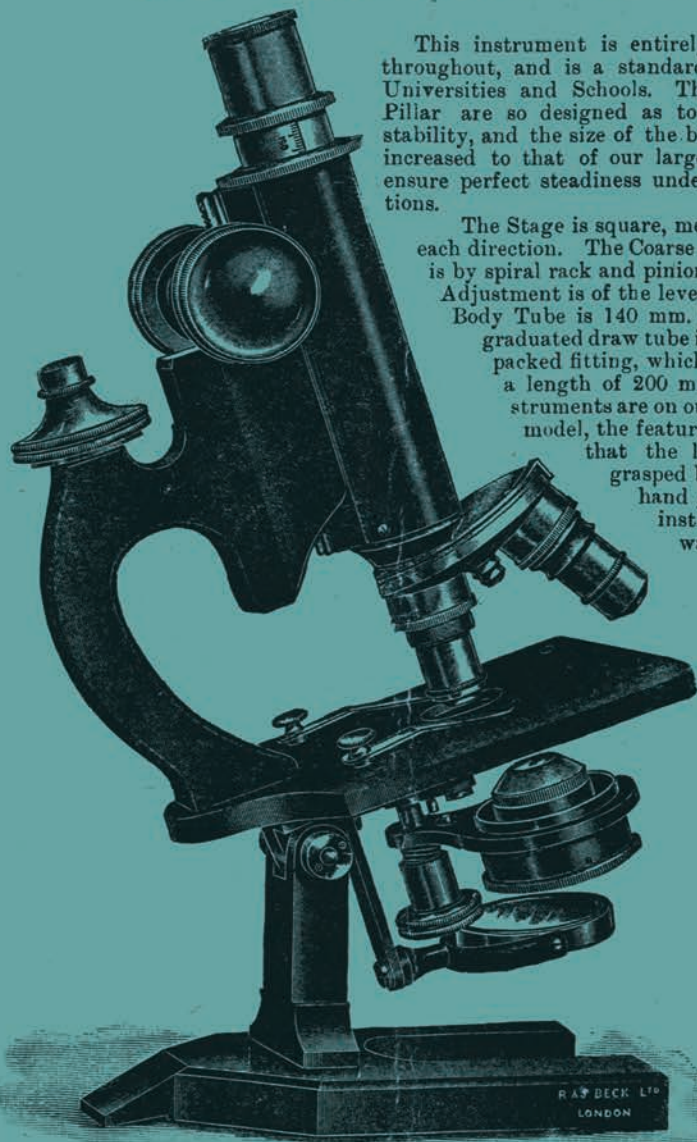
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